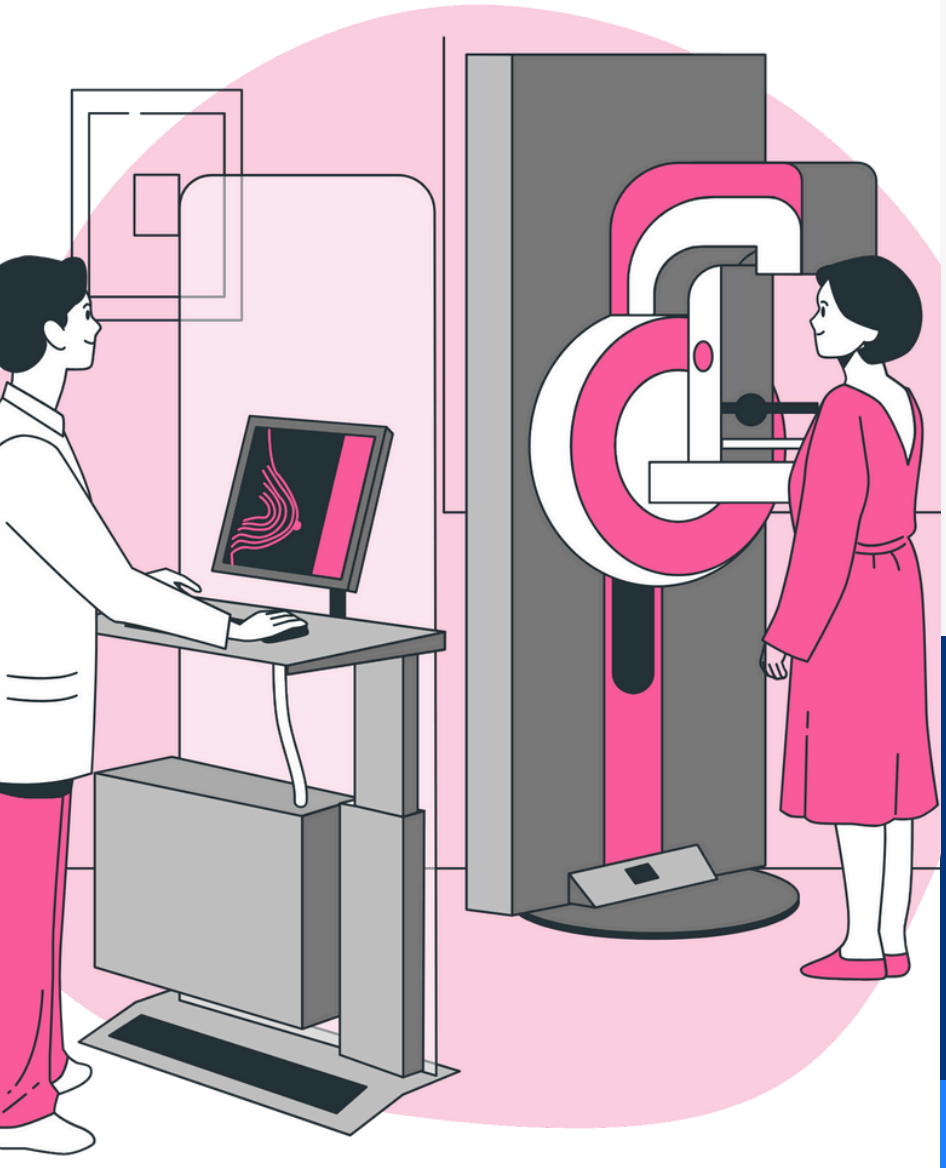
HITLAB

Simplifying Breast Imaging Workflows for Patients & Providers with Send Mammogram

AN EVALUATION BY HITLAB



This report presents HITLAB's Heuristic Evaluation of the MammoVault® App and Facility Platform by Send Mammogram—a secure, digital solution designed to streamline the sharing of prior mammograms reducing administrative delays and improving diagnostic confidence.

Varsha Srivastava, PhD

Vandana Yadav, MS

Stan Kachnowski, PhD, MPA

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Executive Summary

This report presents the findings of a heuristic evaluation conducted by HITLAB on Send Mammogram's MammoVault® App and Facility Platform. Send Mammogram addresses a critical challenge in breast healthcare: the inefficient, outdated process of accessing and sharing prior mammograms, which often leads to delayed diagnoses, unnecessary repeat imaging, and increased patient and provider burden.

The evaluation, guided by Jakob Nielsen's 10 usability heuristics, assessed the platform from the perspectives of key user personas: a proactive breast cancer patient, a breast imaging radiologist and a facility manager. The assessment identified that Send Mammogram is a thoughtfully designed solution with significant potential to streamline breast image management. Key strengths include its secure, digital-first approach that replaces mailed CDs and faxes, real-time request tracking that enhances visibility of system status, and features that promote user control and freedom by empowering patients to manage their own health records.

The evaluation highlighted key areas to enhance Send Mammogram's usability: clearer real-time feedback and error prevention, improved system visibility with confirmations and timestamps, better navigation for user control, and guided onboarding with contextual help. Implementing these enhancements will allow Send Mammogram to provide a seamless, efficient, and patient-centered experience, promoting faster care for breast cancer patients.

Introduction

The Critical Challenges of Prior Mammogram Retrieval

In breast imaging, comparing current mammograms with prior studies is essential. This practice enables radiologists to detect subtle changes, improve diagnostic accuracy, and reduce false positives. Evidence shows that access to prior mammograms can lower recall rates from 16.6% to 6.3%, minimizing unnecessary callbacks and repeat imaging (UCSF study, as cited in Diagnostic Imaging, 2021).

Despite advancements in digital health, the process for obtaining these vital prior images remains entrenched in outdated, inefficient methods. Healthcare facilities, patients, and providers are often burdened by a reliance on mailed CDs, faxed requests, and siloed patient portals. This fragmented system is slow, error-prone and administratively costly, leading to diagnostic delays, redundant exams and immense frustration for all involved.

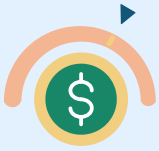
Inaccessible Prior Images: The Clinical Blind Spot

- **The Problem:** Radiologists make diagnostic decisions based on comparison. The absence of prior mammograms forces them to interpret a single study in isolation, lacking the context to distinguish between stable benign findings and new suspicious changes.
- **The Consequence:** This significantly increases diagnostic uncertainty. As cited in the report, recall rates (false positives) can more than double—jumping from an ideal 7-9% to over 16%—when prior images are unavailable. This leads to anxiety for patients and inefficient use of clinical resources (Rauscher et al., 2021).

Archaic and Fragmented Sharing Processes

- **The Problem:** Despite advances in digital imaging, sharing mechanisms remain outdated. Current methods—mailed CDs/DVDs, faxed requests and siloed patient portals—are slow, error-prone and fragmented, forcing patients and providers to navigate cumbersome, disconnected workflows for a single record.
- **The Consequence:** These processes create delays ranging from days to weeks, directly impacting the timeliness of diagnosis and treatment planning. They are the antithesis of modern, connected healthcare (Smith et al., 2022).

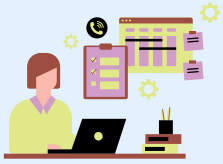
High Recall and Repeat Rates



- **The Problem:** When prior mammograms aren't available, radiologists often have to be extra cautious. A spot that might be safely identified as benign if earlier images were on hand can instead look suspicious, leading to unnecessary callbacks and repeat imaging for confirmation.

- **The Consequence:** This generates a high rate of unnecessary and avoidable procedures. These "repeat exams" increase healthcare costs, expose patients to additional radiation, and cause significant patient anxiety and inconvenience (Johnson & Elmore, 2023; Johnson & Davis, 2020).

Operational Inefficiency and Administrative Burden



- **The Problem:** The burden of chasing down records falls on clinical and administrative staff. This includes:
  - *Technologists & Nurses:* Spending hours on the phone trying to locate records.
  - *Medical Records Clerks:* Processing incoming faxes, burning CDs, and mailing them out.
  - *Radiologists:* Wasting precious reading time waiting for images to arrive or troubleshooting incompatible discs.

- **The Consequence:** This administrative overhead is a massive drain on productivity and staff morale. It diverts highly trained clinical professionals away from patient care and into logistical coordination (Johnson & Davis, 2020).

The Critical Challenges of Prior Mammogram Retrieval

Data Integrity and Compatibility Issues

- **The Problem:** Even when a CD is obtained, it may not work. Common issues include incompatible formats, corrupted or poor-quality discs, incomplete data and so on.
- **The Consequence:** The workflow comes to a complete halt. The process must restart, causing further delays and frustration for the patient and the clinical team (Smith et al., 2022).

Lack of Standardization and Transparency

- **The Problem:** There is no universal, standardized process for exchanging imaging data. Every facility has its own unique protocol, forms, and timelines. Furthermore, once a request is sent, there is often no visibility into its status—whether it was received, viewed, or is being processed.
- **The Consequence:** This creates a "black box" effect, leading to confusion, repeated follow-up calls, and an inability to manage patient expectations effectively (Williams et al., 2021).

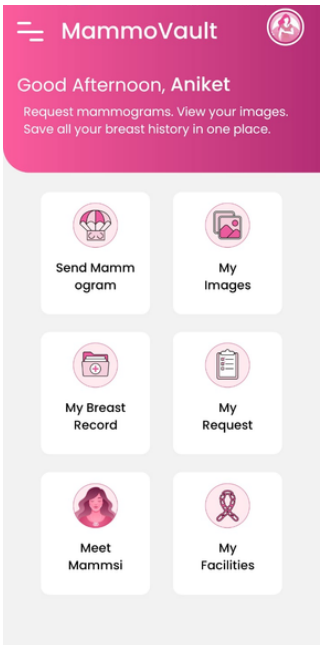
Fragmented health data and inefficient manual processes create critical delays in accessing prior mammograms, leading to compromised care coordination, unnecessary repeat imaging, and increased diagnostic uncertainty. These systemic inefficiencies directly contribute to delayed breast cancer diagnosis timelines, increasing patient anxiety and potentially impacting treatment outcomes.

Send Mammogram

Simplifying Mammogram Access for Patients, Providers and Facilities

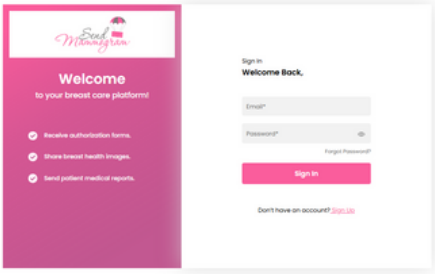
Breast cancer screening is most effective when radiologists can compare new mammograms with prior studies. Yet, outdated workflows—fax requests, mailed CDs, paper forms—often delay care, increase costs, and contribute to unnecessary imaging or biopsies. Send Mammogram addresses this challenge head-on by empowering women to request, store and share prior mammograms and breast health images anytime, anywhere.

MammoVault® App by Send Mammogram



The MammoVault® App empowers patients to request prior mammograms, ultrasounds, and MRIs directly from their mobile devices while adhering to visibility of system status and user control principles. Clear confirmations, timestamps, and digital forms maintain consistency and standards, reduce errors, and streamline complex administrative tasks. By enabling secure, efficient access to historical imaging, the app supports error prevention and efficiency of use, enhancing timely, informed decision-making in breast cancer care.

Facility Platform by Send Mammogram

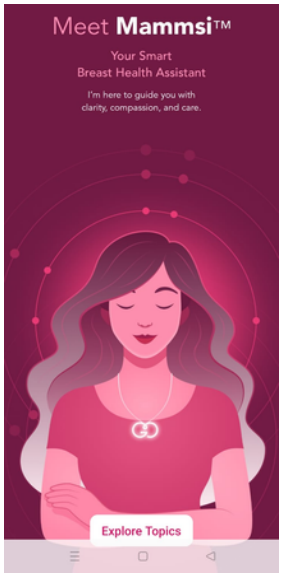


The Facility Platform provides healthcare providers with a secure, cloud-based system for sharing and receiving breast imaging studies. It aligns with Nielsen's heuristics by promoting flexibility and efficiency of use, improving workflow with digital alternatives to mailed CDs and faxes alongwith reducing errors and administrative burden. Together, these features enhance coordination, accelerate diagnostic workflows, and improve patient outcomes.

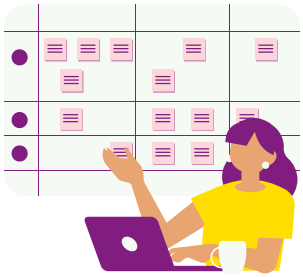
Send Mammogram replaces the fragmented system with a unified, cloud-based platform that connects all stakeholders.

Key features

For Patients (The MammoVault® App):



- *Empowerment:* Gives patients direct control over their breast health records.
- *Digital Requests:* Allows users to securely request prior images from any facility directly through the app using digital authorization forms and e-signatures.
- *Centralized Records:* Provides a secure "MammoVault" to store and access all breast health images (mammograms, ultrasounds, MRIs) and history in one place ("My Breast Record").
- *Transparent Tracking:* Features like "My Request" allow patients to track the status of their requests in real-time, reducing uncertainty.
- *AI Assistance:* Includes an upcoming AI assistant ("Mammsi™") to guide users and answer questions using natural language.

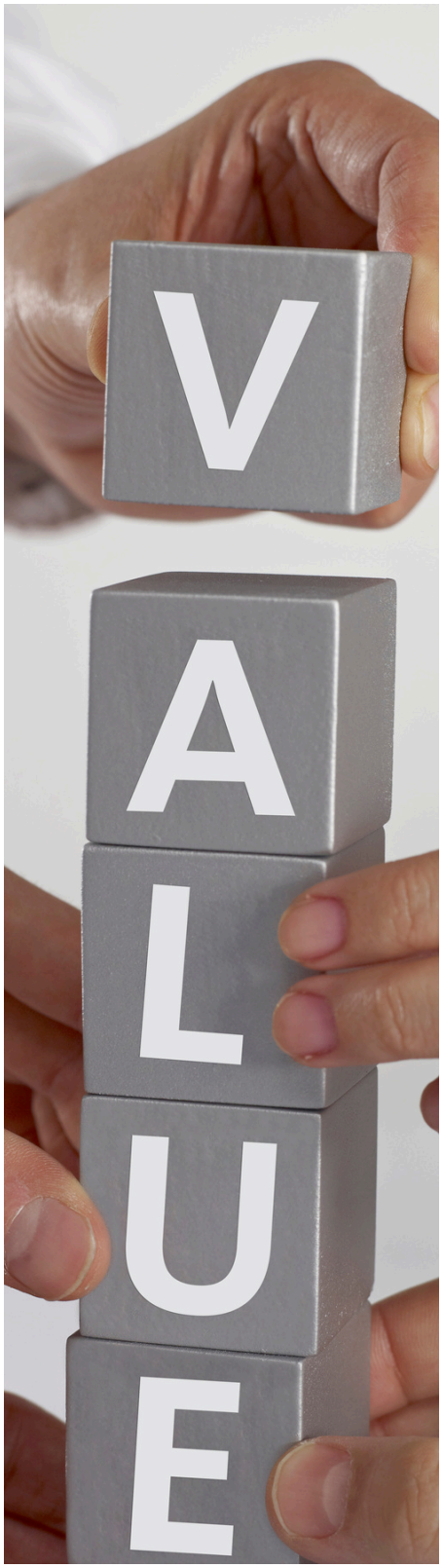


For Facilities & Providers (The Web Platform):

- *Streamlined Workflow:* Provides a secure dashboard for facilities to send, receive, and track mammogram requests digitally, eliminating faxes and CDs.
- *Seamless Integration:* Designed to integrate with existing clinical workflows and systems.
- *Operational Efficiency:* Reduces administrative overhead associated with processing physical requests and media.
- *Compliance:* Built to be HIPAA-compliant, ensuring all data transfers are encrypted and secure.

Key Value Propositions

- *Seamless Image Access:* Enables instant, secure sharing and retrieval of prior mammograms.
- *Connected Care Network:* Creates a unified digital pathway for mammogram exchange between patients, providers, and facilities.
- *Transparent and Reliable Sharing:* Every transfer is secure, traceable, and standardized.



Overall Impact

By ensuring prior images are available when and where they are needed, Send Mammogram aims to:

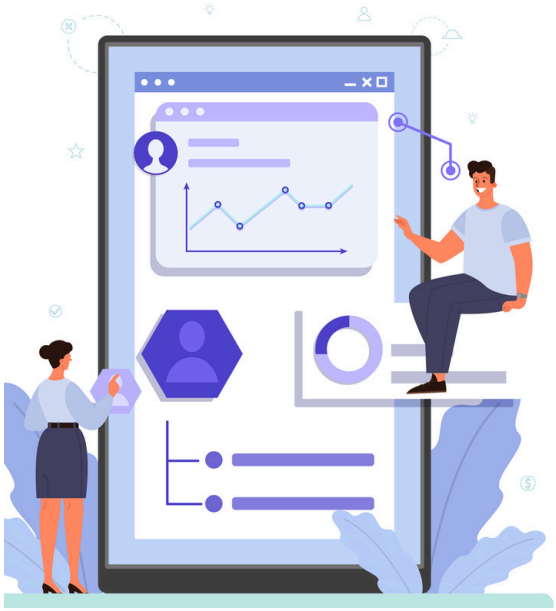
- Improve Patient Outcomes through more accurate and timely diagnoses.
- Enhance the Patient Experience by reducing anxiety, delays, and the administrative burden on those undergoing treatment.
- Increase Clinical Efficiency by streamlining radiologists' workflows and reducing time spent chasing down records.
- Reduce Healthcare Costs by preventing duplicate tests and unnecessary procedures.

Send Mammogram acts as a digital bridge, transforming a fragmented, paper-based process into a seamless, secure, and patient-centered experience for managing breast health records.

Heuristic Evaluation

Personas

HITLAB conducted a heuristic evaluation of the Send Mammogram application (MammoVault® app) and Facility platform, applying structured usability inspection methods to assess its effectiveness, efficiency, and alignment with the workflows of patients, providers and imaging facilities in managing prior mammogram access.



METHODOLOGY

The evaluation was designed to simulate the perspectives of key end-users—including patients, radiologists and facility managers—while providing expert analysis of the platform's design and functionality.

The assessment was guided by Jakob Nielsen's Ten Usability Heuristics, a globally recognized framework for evaluating interface design. Each heuristic principle—visibility of system status; match between system and the real world; user control and freedom; consistency and standards; error prevention; recognition rather than recall; flexibility and efficiency of use; aesthetic and minimalist design; help users recognize, diagnose, and recover from errors; and help and documentation—was systematically applied to identify strengths and areas for refinement.

The evaluation involved a multi-day review of the Send Mammogram patient app (Android & iOS) and its corresponding web-based facility platform. Scenarios were developed to reflect real-world user workflows, focusing on critical tasks such as requesting prior images, tracking request status, managing breast health records, and facilitating digital image transfers between facilities.

EVALUATION PERSONA #1

For the Send Mammogram evaluation, HITLAB experts reviewed the app and facility platform using three personas:

- a 42-year-old breast cancer patient
- a 40-year-old imaging facility manager
- a 48-year-old breast imaging radiologist

Maria Flores

Occupation: Co-Owner & Head Florist at floral shop
Age: 42 years

> *I'm trying to stay strong and focused on my treatment, but I spend more time in driving between clinics than I do resting. My health data feels like it's trapped in the past and I just need a simple, modern way to get my records to the right doctor.*

Background	Goals	Challenges
Maria's routine is physically demanding, filled with designing arrangements, managing inventory & serving customers. Her recent breast cancer diagnosis has thrown her meticulously organized world into disarray. She now must balance the intense physical & emotional demands of her treatment with the relentless pace of running a small business.	• Preserve her energy for healing and for the creative work that sustains her spirit. • Ensure a seamless flow of information between doctors, just like she ensures a seamless flow of fresh flowers for her clients. • Feel organized and in control of her medical journey, reducing cognitive load.	• Treatment fatigue makes long work hours difficult. • Feels her treatment timeline is perishable; delays feel dangerous. • Struggles with navigating digital portals, CDs and email chains for records. • Overwhelmed by balancing care for her family, running her business and being a patient.
Motivations	**Frustrations**	**Needs**
• Empowered by action, seeks tools to solve record-transfer problems herself. • Expects systems that treat her with the tenderness she shows her work. • Values elegant, minimal solutions without unnecessary complexity.	• Feels powerless transferring medical records between providers. • Given outdated technology (CDs) that is essentially ineffective and cumbersome. • No time for administrative tasks.	• Mobile tool to manage medical records between provider appointments. • Confirmation of successful sharing of medical records between facilities. • Elimination of physical transfers to conserve energy.

EVALUATION PERSONA #2

Michael Reynolds

Occupation: Breast Imaging Facility Manager
Age: 40 years

> *Every study counts. My job is to make sure nothing gets lost, every image is accessible, and patient care never waits. I streamline workflows so radiologists can focus on diagnosis, not administration. I ensure every patient's history is complete, because timely, accurate care saves lives.*

Background	Goals	Challenges
Michael has 15 years of experience managing diagnostic imaging centers, with a focus on breast imaging services. He coordinates radiologists, technologists, and administrative staff to ensure smooth workflow from patient scheduling to report delivery in a multi-clinic, hospital-affiliated facility	• Ensure radiologists have seamless access to prior & current studies. • Maintain high operational efficiency & fast report turnaround. • Standardize protocols for image acquisition, storage & sharing. • Ensure compliance with legal & accreditation requirements.	• Transferring studies from multiple sources in inconsistent formats. • Managing high imaging volumes without delays. • Handling outdated or incompatible software. • Resolving missing patient records or incomplete data.
Motivations	**Frustrations**	**Needs**
• Improve patient outcomes via timely & accurate imaging. • Use technology to reduce administrative workload. • Create smooth & standardized workflows for staff.	• Technical issues delay study imports and reporting. • Radiologists face delays due to missing studies. • Manual administrative work wastes staff time. • Poor communication with external imaging facilities.	• Browser-based access to prior mammograms from any facility. • Automatic integration of outside studies into local PACS/EMR. • Standardized, minimal-effort processes for sending/receiving studies.

EVALUATION PERSONA #3

Dr. Elena Vance

Occupation: Breast Imaging Radiologist
Age: 48 years

> *With over two decades of experience, my focus is on precision and clarity. Every image tells a story, and my job is to interpret it accurately and efficiently. I juggle a high-volume caseload, strive for definitive diagnoses, and need technology that supports, not hinders, my workflow. My priority is patient safety through early detection.*

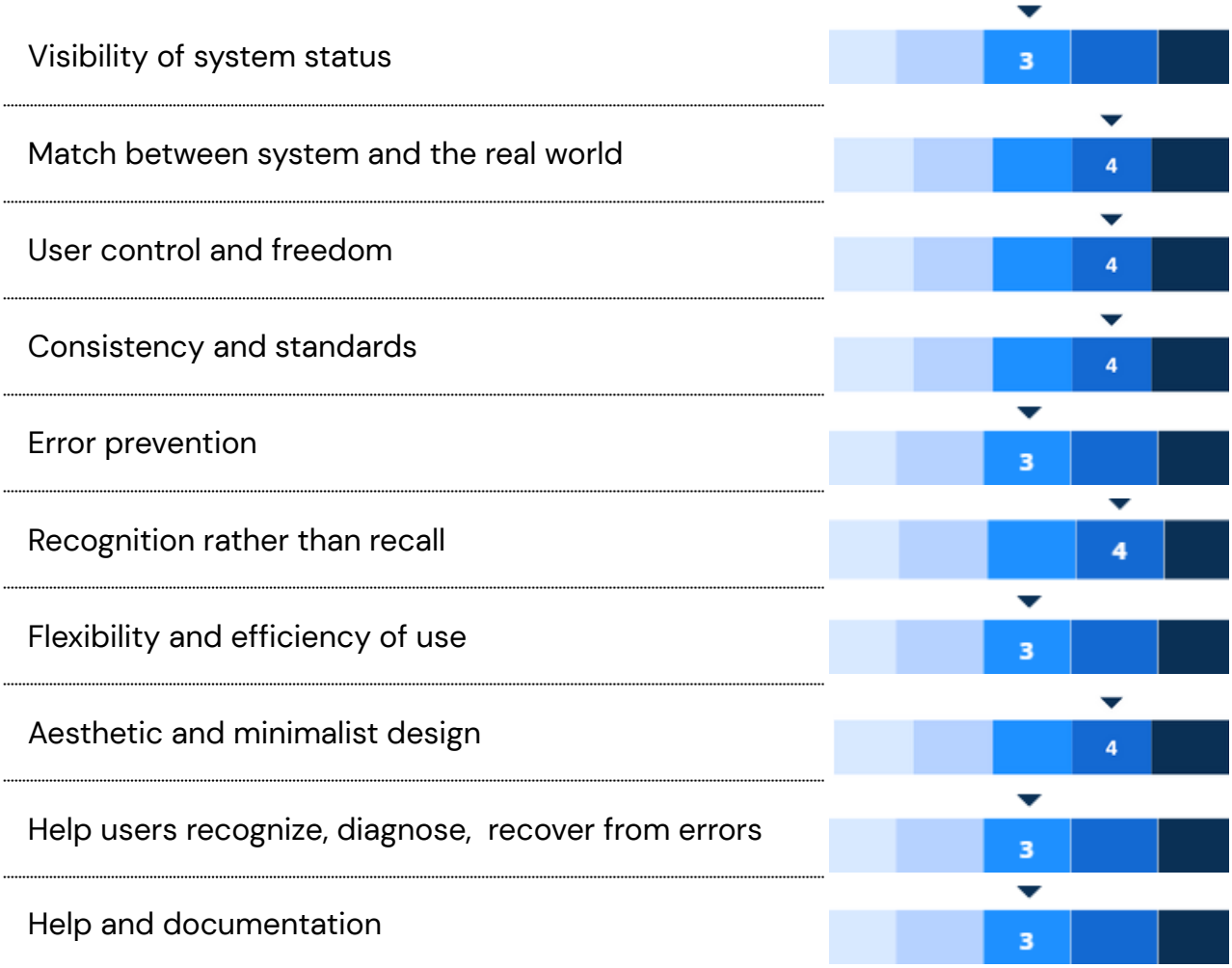
Background	Goals	Challenges
Dr. Vance is a partner in a large private radiology group that reads studies for multiple hospitals and outpatient imaging centers. She is highly specialized and deals with the immense pressure of diagnostic accuracy. She needs a reliable system for managing reports to avoid delays and maintain her diagnostic rhythm.	• Provide accurate, timely interpretations to directly impact patient outcomes. • Maintain a high reading efficiency without sacrificing diagnostic confidence. • Minimize administrative friction to maximize time spent on actual image analysis. • Ensure a seamless legal and audit trail for all studies.	• Managing an overwhelming volume of studies from various sources (hospitals, clinics etc.). • Wasting critical time chasing down prior mammograms for comparison, which is essential for accuracy. • Dealing with incompatible software, lost CDs, and poor-quality burns that halt the workflow.
Motivations	**Frustrations**	**Needs**
• Driven by the critical role of early detection in saving lives. • Values technology that enhances diagnostic precision and reduces cognitive load. • Values technology that enhances diagnostic precision and reduces cognitive load.	• Lose precious reading time every day dealing with technical hiccups. • Not having prior studies for comparison increases uncertainty and risk. • Current process for importing outside studies is clunky & non-standardized.	• Instant, browser-based access to prior mammograms from any facility. • Automatic import of outside studies into local PACS/EMR. • A simple, standardized process for sending & receiving studies

Findings

The Send Mammogram platform demonstrated a solid foundation, scoring consistently across key usability dimensions with most ratings in the 3–4 range (on a 5-point scale), indicating a robust, positive, and patient-oriented design. The evaluation identified several notable strengths in areas such as user control, consistency, and matching system design to real-world needs.

The study findings also highlight some opportunities for refinement in the platform's workflows and interface design to enhance clarity, reduce user errors, and improve the overall experience for both patients and facility staff before broader scale-up.

Heuristic Ratings



Strengths Identified

- **Intuitive Navigation:** Key functions like requesting prior images and tracking requests are logically organized, enabling patients and providers to complete essential tasks efficiently.

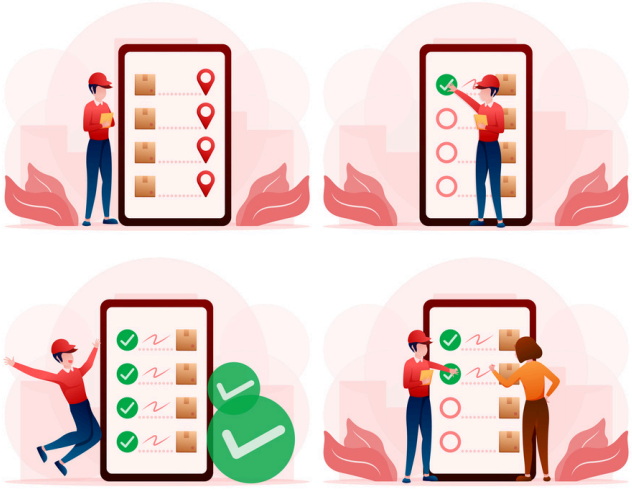
- **Workflow Integration:** The platform provides a unified digital pathway for mammogram sharing, effectively replacing outdated manual processes like CDs and fax requests that disrupt clinical workflows.

- **Patient-Centered Design and Minimized Memory Load:** Features such as "Send to Self" and centralized breast health records give patients direct control over their medical images, promoting engagement and autonomy. Saved facilities, past requests, and stored records reduce cognitive load; the upcoming ™ AI tool will guide users with options.

- **Consistent Layouts and Process Standardization:** Uncluttered interface, patient-friendly layouts, and well-organized tabs. Digital authorization forms with e-signatures create a consistent, secure method for image transfers, reducing administrative errors and variability across facilities.

- **Status Transparency:** Real-time tracking of request status helps patients and facility staff monitor progress, reducing uncertainty about image transfer completion.

- **Security and Compliance:** Built-in HIPAA compliance and encryption protocols ensure sensitive health data is protected throughout the sharing process, maintaining patient confidentiality.



Opportunities for Improvement

HITLAB's evaluation identified several targeted refinements to further improve the user experience for patients, providers, and facility staff:

- **Data Validation:** Cross-check Address with City and State to ensure data integrity.
- **Request Status:** Clearly label rejected requests and specify supported file formats.
- **Facility Selection:** Show only registered facilities or visually mark unregistered ones.
- **Tracking & Traceability:** Display unique request IDs, timestamps, and facility names with search/sort/filter options.
- **Payment & Confirmation:** Update messages to include next steps, notifications, and review links.
- **Form Guidance:** Add tooltips or inline instructions for the ROI form.
- **File Upload:** Restrict to supported formats and provide inline guidance for error-free uploads.

Recommended Next Steps

To systematically enhance the platform, HITLAB recommends a phased approach:

- **Immediate Refinements (0–2 months):** Address high-impact usability issues such as form validation, error messaging, and critical feature functionality.
- **User Experience Optimization (2–4 months):** Implement enhancements to navigation, visual design, and user guidance, including the addition of search/sort features and improved help resources.
- **Pilot Validation & Scaling (4–6 months):** Conduct a controlled rollout, gather feedback from patients and facility staff on streamlined workflows, and measure key outcomes such as reduction in request processing time and user satisfaction.

Conclusion

The heuristic evaluation conducted by HITLAB confirms that the Send Mammogram platform provides a robust and much-needed solution for streamlining prior mammogram access. The platform demonstrates a strong foundational design that effectively addresses critical gaps in breast imaging workflows by replacing outdated, manual processes with a secure, digital-first approach. Its patient-centered features—such as centralized health records, real-time request tracking, and flexible sharing options—empower users and reflect a clear understanding of their needs.

The evaluation identified specific areas for enhancement, particularly concerning data validation, system feedback and interface clarity. Addressing these opportunities will further refine the user experience, reduce potential for error and strengthen platform adoption.

With its focused utility and commitment to usability, Send Mammogram is well-positioned to improve care coordination, reduce administrative delays, and support more timely and confident breast cancer diagnoses. Continued attention to user-centered design and iterative refinement will enable the platform to maximize its positive impact on patients, providers, and healthcare facilities alike.

> *"Send Mammogram transforms breast health management by replacing fragmented workflows with a seamless digital pathway. Patients easily control their records, and clinicians access prior images instantly for accurate comparisons. By streamlining care and building trust across the continuum, it drives faster, more precise breast care."*
> ***— Stan Kachnowski, Chair, HITLAB***

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HITLAB

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Contact us for further inquiries

Stan Kachnowkski PhD MPA
212-543-0107
swk16@hitlab.org
hitlab.org

HITLAB is a leading healthcare innovation lab dedicated to improving health outcomes worldwide. Through rigorous research, education, and collaboration, HITLAB identifies and supports the development of transformative health technologies.